1. A fuel reformer system, comprising:

    a plasmatron fuel reformer;

    a first reaction extension region connected downstream from said plasmatron fuel reformer;

    a supplemental nozzle section connected to said first reaction extension region; and

    a second reaction extension region connected downstream from said supplemental nozzle section.

2. The fuel reformer system of claim 1, further including:

    at least one additional nozzle section connected to said second reaction extension region.

3. The fuel reformer system of claim 1, further including:

    at least one additional reaction extension region connected downstream from said second reaction extension region.

4. The fuel reformer system of claim 1, wherein said first reaction extension region has a length from approximately 2 cm to 8 cm and has a diameter from approximately 2 cm to 6 cm.

5. The fuel reformer system of claim 1, wherein said supplemental nozzle section includes at least one air input and at least one fuel input

6. The fuel reformer system of claim 1, wherein plasma air is introduced through at least one nozzle that generates an air velocity in the range of approximately 25-100 m/s.

7. The fuel reformer system of claim 6, wherein the plasma air flow rate is in the range of approximately 15-60 liters/minute and hole diameters of said at least one nozzle are in the range of approximately 0.03-0.07 inches.

8. The fuel reformer system of claim 1, wherein the distance between a fuel nozzle and a plane half way between the electrodes is approximately 0.2 inches.

9. The fuel reformer system of claim 1, wherein at least one catalyst is positioned in at least one of said reaction extension regions.

10. The fuel reformer system of claim 1, wherein a magnetic coil is positioned in said plasmatron fuel reformer to generate a magnetic field that shapes plasma in said plasma discharge region, and where the current flowing in the discharge is unipolar.

11. The fuel reformer system of claim 10, wherein the magnetic field both rotates the plasma and pushes it inward.

12. The fuel reformer system of claim 1, wherein said system is adapted to produce a temperature of hot gas exiting from the first reaction extension region that is at least 900°C.

13. The fuel reformer system of claim 1, wherein fuel atomization pressure in a nozzle used in the supplemental nozzle section is less than one-third of fuel atomization pressure in a nozzle used in the plasmatron fuel reformer.

14. The fuel reformer system of claim 1, where air is injected downstream from the first reaction extension region for preheating, and wherein a first stage including the plasmatron fuel reformer and the first reaction extension region operates at O/C ratios between partial oxidation and full combustion.

15. The fuel reformer system of claim 1, where fuel is injected downstream from the first reaction extension region for preheating, and wherein a first stage including the plasmatron fuel reformer and the first reaction extension region operates at O/C ratios between partial oxidation and full combustion.

16. The fuel reformer system of claim 1, wherein fuel and air are injected downstream from the first reaction extension region for preheating, and wherein a first stage including the plasmatron fuel reformer and the first reaction extension region operates at O/C ratios between partial oxidation and full combustion, and a second stage including the supplemental nozzle section and the second reaction extension region operates, though control of air/fuel injection in the first and second stage, at conditions of low turbulence and poor mixing in order to generate a warm combustible mixture.

17. The fuel reformer system of claim 1, further comprising a turbulizer disposed downstream from the first reaction extension region and that generates turbulence.

18. The fuel reformer system of claim 1, where a first stage including the plasmatron fuel reformer and the first reaction extension region operates at conditions of non-uniformity of air/fuel mixture, wherein control of turbulence for plasmatron operation is provided through control of the ratio of the mixing time to residence time, and wherein a second stage including the supplemental nozzle section and the second reaction extension region generates flow patterns that when injected into the main flow result in turbulence.

19. The fuel reformer system of claim 18, wherein the turbulence in the second extension reaction cylinder is provided by the generation of a swirl motion in the second air/fuel mixture that is opposite to a swirl motion of gas in the first stage.

20. The fuel reformer system of claim 18, further comprising a separator element between the flow in the first stage and the second stage.

21. The fuel reformer system of claim 20, wherein said separator element is also a thermal element such that heat deposited by the flow mixture in the first stage is used for preheating the air and/or the fuel injected in the second stage.

22. The fuel reformer system of claim 1, wherein at the low flow rates electrical power delivered to the plasmatron fuel reformer is decreased by decreasing the current of a power supply.

23. The fuel reformer system of claim 1 wherein at the low flow rates electrical power delivered to the plasmatron fuel reformer is decreased by pulsing a power supply at low duty cycle operation.

24. The fuel reformer system of claim 1, wherein the O/C ratio in a first stage including the plasmatron fuel reformer and the first reaction extension region is between approximately 2 and 7.

25. The fuel reformer system of claim 1, wherein said system is adapted for operation with gasoline.

26. The fuel reformer system of claim 1, wherein said system is adapted for operation with diesel.

27. The fuel reformer system of claim 1, wherein said system is adapted for operation with any liquid hydrocarbon.

28. A method of fuel reforming, comprising:

providing fuel and air to a plasma discharge region in a plasmatron fuel reformer;

establishing a plasma discharge in said plasma discharge region to initiate a reaction;

extending said reaction in a first reaction extension region;

establishing a fluid input downstream from said first reaction extension region;

extending said reaction in at least one additional reaction extension region.

29. The method of claim 28, wherein said fluid input established downstream from first reaction extension region includes air and fuel.

30. The method of claim 28, further comprising:

positioning at least one catalyst in at least one of said reaction extension regions.

31. The method of claim 28, further comprising:

shaping plasma in said plasma discharge region utilizing a magnetic field.

32. The method of claim 28, further comprising:

generating turbulence downstream from said first reaction extension region.

33. The method of claim 28, wherein fuel atomization pressure in a nozzle used in a supplemental nozzle section disposed downstream from said first reaction extension region is less than one-third of fuel atomization pressure in a nozzle used in the plasmatron fuel reformer.

34. The method of claim 28, where air is injected downstream from the first reaction extension region for preheating, and wherein a first stage including the plasmatron fuel reformer and the first reaction extension region operates at O/C ratios between partial oxidation and full combustion.

35. The method of claim 28, where fuel is injected downstream from the first reaction extension region for preheating, and wherein a first stage including the plasmatron fuel reformer and the first reaction extension region operates at O/C ratios between partial oxidation and full combustion.

36. The method of claim 28, wherein fuel and air are injected downstream from the first reaction extension region for preheating, and wherein a first stage including the plasmatron fuel reformer and the first reaction extension region operates at O/C ratios between partial oxidation and full combustion, and a second stage including at least one additional reaction extension region that operates, though control of air/fuel injection in the first and second stage, at conditions of low turbulence and poor mixing and that generates a warm, easily combustible mixture.

37. The method of claim 28, wherein at low flow rates electrical power delivered to the plasmatron fuel reformer is decreased by decreasing the current of a power supply.

38. The method of claim 28, wherein at the low flow rates electrical power delivered to the plasmatron fuel reformer is decreased by pulsing a power supply at low duty cycle operation.

39. The method of claim 28, wherein the O/C ratio in a first stage including the plasmatron fuel reformer and the first reaction extension region is between approximately 2 and 7.

40. The method of claim 28, wherein said fuel is gasoline.

41. The method of claim 28, wherein said fuel is diesel.

42. The method of claim 28, wherein said fuel is any liquid hydrocarbon.

43. A fuel reformer system, comprising:

a plasmatron fuel reformer having at least two electrodes disposed to form a plasma discharge region; and

at least two fluid heads disposed upstream from said plasma discharge region and that deliver at least one of air and fuel into said plasma discharge region,

wherein the at least two fluid heads operate to provide adjustment of fluid flow rates.

44. The fuel reformer system of claim 43, wherein each of said at least two fluid heads includes controls for discrete operation of fluid flow rates.

45. The fuel reformer system of claim 43, wherein each said at least two fluid heads operates at a distinct time to provide continuous adjustment of fluid flow rates.

46. The fuel reformer system of claim 43, wherein said at least two fluid heads include at least two nozzles of different dimensions.